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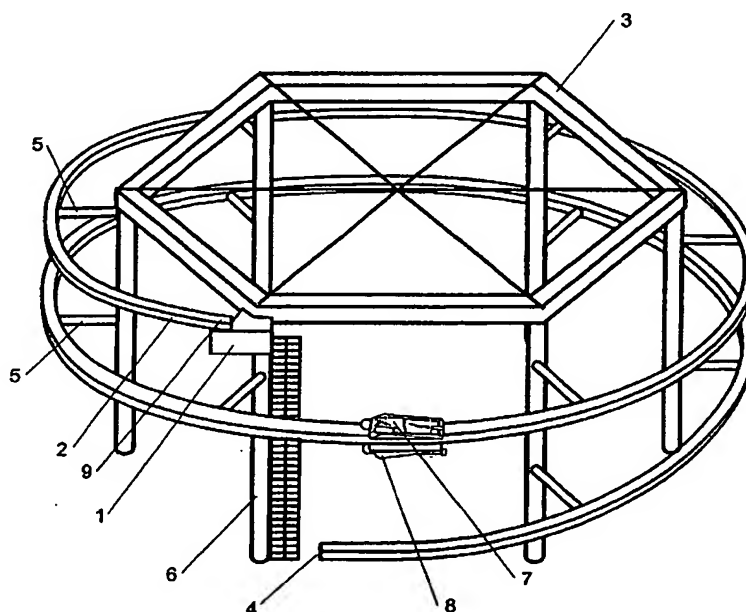
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(54) Title: MULTI-CAPACITY AMUSEMENT RIDE



(57) Abstract: An amusement ride including a non-continuous track (2) supported over a curved path and extending between a high end (9) and a low end (4) for transporting riders (7, 8). The track (2) includes at least two independent running rails (34, 35). The amusement ride also includes at least one carrier (32, 33) arranged to carry at least one rider on each running rail (34, 35) of the track (2). The carriers (32, 33) include attachment means (36, 37) arranged to slidably engage with the running rails (34, 35) to enable the carriers (32, 33) to descend carrying the riders (7, 8) from the high end (9) to the low end (4).

MULTI-CAPACITY AMUSEMENT RIDE

FIELD OF INVENTION

- 5 The invention relates to amusement rides and in particular to a ride arranged so that two or more riders may be attached by harnesses or carriers to different parts of a track which the riders descend

BACKGROUND

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Rides have been devised to move a rider from one point to another with the ride following the line of a cable. In these rides the rider either holds onto or sits on a cross beam suspended from the cable or rides in a cart suspended from a cable, or similar. These "flying fox" or "zip line" rides start at a higher point above the ground and end at

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a point away from the start point and nearer the ground than the start point. A disadvantage with a flying fox or zip line ride is that once the ride is finished the crossbeam or cart must be retrieved from the end point and returned to the start point.

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Another disadvantage is that a flying fox or zip line typically runs along a straight path and cannot be formed into a circular route or be formed into twists or turns to increase the rider's enjoyment of the ride. Another disadvantage is that a flying fox typically cannot support riders above and below the cable at the same point and consequently the number of rides possible in a given period, and the potential economic benefit to the ride operator, is reduced.

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Another form of ride is the roller coaster where riders are strapped or otherwise held in seats in carriages that move along a track. The roller coaster is typically permanently attached to the track. In these rides the start and end points are in the same place and some form of power is required to move the carriage into position to begin the ride. A

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disadvantage with this sort of ride is that a roller coaster track typically cannot support riders separately attached to different sides or parts the track at the same linear point and at the same time. Consequently the number of rides possible in a given period, and the potential economic benefit to the ride operator is reduced. A further disadvantage is

that a single roller coaster track typically does not allow riders to apparently race each other along or down the track during the course of the ride.

5 Roller coasters have been developed with riders seated in carriages above and below the rail. US patents 6,269,750 and 6,047,645 and Japanese patent abstract JP 09-117570 show examples of this type of roller coaster. Like other roller coasters these systems form closed loop tracks. One disadvantage of these systems is that they cannot be formed into open loop system as the carriages are too bulky to be easily transported. An obvious consequence of such bulky carriages is that a more substantial, and therefore
10 costly, track and support structure is required to support the carriages.

Another disadvantage is that the riders are constrained within the carrier which limits the apparent danger of the ride.

15 US patent 5,979,333 is an example of an amusement ride where the rider is in a prone position. This ride forms a continuous loop and cannot be formed into an open loop ride as the carrier for the rider is too bulky to be easily transported. A further disadvantage of this type of ride is that it does not allow for riders above and below the track or for two or more riders to traverse the same part of the track at different times.
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A further disadvantage apparent with the abovementioned rides is that generally at least two running rails are required to support each carrier.

SUMMARY OF INVENTION

25 It is the object of the current invention to overcome or alleviate some of the disadvantages described above or to at least provide the public, and/or those in the business of operating such amusement rides, with a useful choice.

30 In broad terms in one aspect the invention comprises an amusement ride including a non-continuous track supported over a curved path and extending between a high end and a low end, the track including at least two independent running rails and at least one

carrier arranged to carry at least one rider on each running rail of the track the carriers including attachment means arranged to slidingly engage with the running rails to enable the carriers to descend carrying the riders from the high end to the low end.

5 The riders may traverse the track simultaneously or at different times.

In this aspect the track extends between a high end and a low end and generally slopes down from the high end to the low end. However the track may include curves, twists, barrel rolls and loops and other sections where the slope is not uniform between the
10 high end and the low end. The slope of the track may vary along the length of the track.

The structure around which the track is arranged may be a solid structure or may be supports forming a skeleton or shell of a structure. The structure may also be a natural feature such as a canyon or valley and the track may be sited in such a natural feature.
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In this aspect preferably the amusement ride includes means for riders to ascend from the bottom of the structure to a platform on the structure at or near the high end of the track. Preferably the low end of the track is close to the means to ascend to the platform. Alternatively the high and low ends of the track may be in different places.
20 The ride may also include mechanical means to elevate the carriers, independently of the riders, to the high end of the track.

In broad terms in another aspect the invention comprises an amusement ride including a track supported over a path, the track including at least one embark point where rider(s)
25 begin the ride, the track including at least two independent running rails, and at least one carrier arranged to carry at least one rider in a substantially prone position each running rail of the track, the carriers including attachment means arranged to slidingly engage with the running rails to enable the carriers to traverse the ride carrying the riders.

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The riders may traverse the track simultaneously or at different times.

The amusement ride may be arranged around a structure which may be a solid structure or may be supports forming a skeleton or shell of a structure or even poles. The structure may also be a natural feature such as a valley or canyon and the track may be situated in such a feature.

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The amusement ride in the second aspect may also include mechanical means for the rider(s) to ascend the track to a high point of the track from where the riders descend through gravitational forces. The movement of riders along the track may be controlled by a known computerised ride management and/or braking system.

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The term track is used throughout the specification to include a solid beam or guide structure or a beam or guide structure that is not solid and running rails to which the harnesses or carriers are attached. The running rails may be formed as an integral part of the track.

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In this specification where the track is a pipe or other hollow beam the term running rail includes the distinct part of the track onto which the carriers can be slidingly engaged.

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In this specification where the track is an "I" beam or other solid beam the term running rail includes that part of the beam onto which the carriers are directly slidingly engaged.

In general the running rail is the part of the track onto which carriers are directly slidingly engaged. The running rails may be part of the track or may be distinct structures attached to the track. The word "rail" in the term "running rail" is not limiting on the shape of the running rail. Differing shapes and sizes of running rails

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may be provided within the invention.

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Each running rail allows a carrier or carriers to slidingly engage with the running rail without contacting carriers engaged to other running rails of the track. This means that carriers slidingly engaged on different running rails may move past one another along the track. For example a track may be a beam or a plurality of beams joined together either directly or by trusses or similar construction methods to form one unitary rigid member. Although described as rigid, it is known that there will be some flexing due to

the weight of the track itself and the weight of the riders moving along the running rails of the track.

5 The running rails may be identical so that by way of example the ride on top of the track is in effect a reflection of the ride under the track. Alternatively the running rails may be different.

BRIEF DESCRIPTION OF DRAWINGS

10 The invention will be further described by way of example only and without intending to be limiting with reference to the following drawings, wherein:

Figure 1 shows a first embodiment of amusement ride of the invention;

Figure 2 shows a second embodiment of amusement ride of the invention;

Figure 3 shows two riders on a track of the invention;

15 Figure 4 is a cross-sectional view of one form of carrier and wheel assembly of the invention;

Figure 5 is a view of harness that may be used to secure riders into carriers;

Figure 6 shows two riders on a track of the invention;

20 Figure 7A is a side view of a further embodiment of track that may be used for an amusement ride of the invention;

Figure 7B is a cross-sectional view of the track of Figure 7A;

Figure 8A is a side view of a further embodiment of track that may be used for an amusement ride of the invention;

Figure 8B is a cross-sectional view of the track of Figure 8A;

25 Figure 9 shows an amusement ride of the invention where the track is suspended; and

Figure 10 shows an amusement ride of the invention where the track runs down a valley.

DETAILED DESCRIPTION OF PREFERRED FORMS

Figure 1 shows one form of amusement ride of the invention. The amusement ride starts from platform 1 which is near the high end of track 2. Track 2 curves around
5 hexagonal structure 3 from platform 1 to at or near the ground at low point 4. The track is supported by support means 5 cantilevered from hexagonal structure 3.

The track 2 extends between high end 9 and low end 4. The track is non-continuous in that the high end of the track is not directly joined to the low end. The track is shown as
10 having a smooth descent curve in Figure 1 but the track may include twists, spirals, loops, barrel rolls, sections of steeper descent and other deviations from a uniform descent, slope and/or curve. At the low end of the track, the track may be substantially horizontal or may curve up slightly to slow the rider(s) to a stop. Alternatively other means of stopping the rider(s) may be used.

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The track may be arranged to impart side to side motion to the rider(s). This may be by means of the supports or by twists in the track. Alternatively the track may be arranged not to impart side to side motion to the riders.

20 In one embodiment the track is a rigid member. The rigid member may be a beam or a plurality of beams or pipes enjoined to form one rigid member. Although described as rigid, it is known that there will be some flexing due to the weight of the member itself and the weight of the riders moving along it. The track 2 includes two or more running rails, each of which is arranged to engage at least one carrier. In the embodiment of
25 Figure 1, track 2 has two running rails (not shown), one for each rider 7, 8.

Where it is desired to arrange the track so as to impart side to side motion to the riders, for example to alter the quality of the ride, then the track may alternatively be supported by cables or other non-rigid means so that the track is not fixed in space.

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The hexagonal structure of Figure 1 also optionally includes means for a rider(s) to ascend from the bottom of the ride at point 4 to platform 1 up pillar 6. This may be by

means of a set of steps, an elevator, or some other device. The high and low ends of the track may be arranged in a substantially straight line vertically, or close together, so that a rider does not have far to walk to ascend to the platform and begin another ride and the attachment means do not have to be retrieved from a distant point. Alternatively the high and low ends of the track may be in different locations.

In one embodiment if the high and low ends of the track are close, mechanical means may be provided to move carriers from the low end of the track to the high end of the track. The mechanical means may also be suitable for transporting carriers with riders harnessed into the carriers. In this embodiment riders queue at the bottom of the ride and begin the ride by being harnessed into a carrier and transported to the high end of the ride.

Although the hexagonal structure is shown as a skeleton or shell the structure around which the track extends may be solid, for example a building. A solid structure will suffice so long as clearance is allowed between the track and structure so that a rider does not risk impacting the structure. The structure supporting the track is not limited to a hexagonal shape and may be any suitable shape or type including towers or poles. The structure may also include a natural feature such as a valley or canyon in which the ride is arranged.

In one embodiment the support means attaching the track to the hexagonal structure are preferably formed from rigid material. Support wires or cables may also be used to add stability to the track. In another embodiment support the track may be supported by support cables. The support means are shown on the outside of the hexagonal structure but may alternatively be arranged with the track inside the hexagonal structure to provide a ride with steeper curvature than the ride shown in Figure 1. In another embodiment the track may be arranged partially inside and partially outside the structure.

The amusement ride apparatus of the invention also includes harnesses or carriers into which or onto which a rider(s) is harnessed. The carriers include attachment means

(shown in Figure 4) arranged to slidably engage with the track around the hexagonal structure both on top of the track and underneath the track. The attachment means are arranged to slide around the track from high end 9 to low end 4 when engaged with the track. The attachment means may be engaged to the track at the high point of the ride and disengaged from the track at the low point of the ride. In a ride with a continuous track or mechanical means for moving the carriers (and in some embodiments the riders) to the top of the track the attachment means may engage with the mechanical means for moving the carriers.

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- 10 The attachment means or the track itself may also include a braking system arranged to slow the carriers and riders at the low end of the ride or during the course of the ride to control speed. The braking system may be magnetic and automatically slow a carrier as it passes a position on the running rail. Typically this will occur at or near the end of the ride but alternatively it may also occur at other points along a running rail.
- 15 Alternative braking systems can also include operator controlled braking and rider controlled braking or a combination of systems.

- The carriers may be arranged to fit a single rider or to fit a plurality of riders. For example, a group of riders may be harnessed together for a ride. In a preferred embodiment the carriers are arranged so that the rider is lying substantially prone during at least part of the ride. In this embodiment preferably the carriers and attachment means are sufficiently lightweight so that at the end of the ride they can be manually transported to the high end of the track. Transport may be by lift or stairs. Alternatively if the low end of the track is spaced away from the high end transport may include vehicular transport or an existing mechanical means such as a ski field chair lift.
- 20
- 25 The carriers and attachment means are generally sufficiently lightweight to be carried on a single running rail on the track and should be sufficiently lightweight to enable an operator or operators to engage the carriers and attachment means with the track without mechanical assistance.

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In use a rider(s) is harnessed into the carrier either while on the platform or on the ground before ascending to the platform. In one embodiment when the harnessed

rider(s) is on the platform an operator engages the attachment means of the carrier to the running rail either below or above the track as required. In another embodiment the harnessed rider(s) are transported from the ground to the start of the ride by mechanical means. These means may also engage the attachment means with the start of the track.

5 The operator is then able to begin the ride by moving the carrier to the start point of the running rail. In a further embodiment when the track is continuous the rider(s) are harnessed into carrier(s) at the bottom of the ride and are moved by mechanical means to a high point of the ride to begin the ride. The track may include a section of steep descent to give the rider(s) the initial impression of free falling or flight. The running
10 rails may also include sections where the running rails and track twists and/or turns and/or "barrel rolls" or becomes inverted with respect to the rider(s).

In preferred embodiment the only force on a rider as the rider descends the ride is gravity. In alternative embodiments known mechanical or electrical power propulsion
15 means may be provided on the carriers and/or on the tracks.

At the conclusion of the ride the rider(s) may detach the carrier attachment means from the running rail or an operator may do this. The rider(s) may then ascend to the platform again or may take the harness or carrier off so that another rider(s) may use the
20 ride.

A rider on a running rail above the track may be directly above a rider in a carrier on a running rail below the track. Alternatively the rider on the running rail above the track may not be directly above a rider in a carrier on a running rail below the track. The two
25 rides are separate and can be operated independently of each other. Alternatively the riders can commence their rides at the same time and apparently race each other to the conclusion of the ride.

More than one rider may be simultaneously harnessed to a carrier engaged with a
30 running rail. So long as the riders are spaced apart and one rider cannot catch up with the rider in front a plurality of riders may use the same running rail.

Figure 2 shows a second embodiment of the invention. In this embodiment the track is continuous in that it forms a closed loop or circuit and the carriers and attachment means remain engaged with the running rails of the track. A mechanical elevator 10 is used to take the harnessed riders and attachment means to the high point 9 of the track 2 from where they descend by gravitational force to low point 4.

The track is shown as having a smooth descent curve in Figure 2 but may include twists, spirals, loops, sections of steeper descent and other variations from a uniform descent and/or curve. The track may also be arranged to impart side to side movement to the rider(s).

Again where it is desired to arrange the track so as to impart side to side motion to the riders then the track may alternatively be suspended by cables or other non-rigid means so that the track is not fixed in space.

Again the structure may include a natural feature and is not limited to a hexagonal shape. The track may be inside, outside or partially inside and outside the structure.

Unlike the embodiment described with reference to Figure 1, in use a rider(s) is harnessed into the carrier and attached to the track at a lower point before ascending to the high point of the track via the mechanical elevator 10. At the conclusion of the ride the riders are detached from the harness or carrier and attachment means that remain engaged with the running rails of the track. Alternatively the riders may start the ride where the track at a higher point and exit the ride where the track at a lower point as shown in Figure 1 but the carriers may remain on the track and be lifted to the high point of the track via the elevator 10. In the alternative embodiment a lighter, less expensive elevator may be utilised.

Figure 3 is a side view of one track 38 of the invention showing two riders on running rails 34 and 35. At this point along the track, rider 30 is in an upright position above running rail 34 and rider 31 is positioned beneath running rail 35. Riders 30 and 31 are harnessed into carriers 32 and 33 by harness pieces 40-45. Carriers 32 and 33 move

slidingly along running rails 34 and 35 using attachment means 36 and 37. In this embodiment the attachment means are wheel assemblies. Figure 4 shows the wheel assemblies in more detail. In this embodiment two wheel assemblies are used, however in other embodiments different number of sets of wheels may be used.

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In the portion of track shown in Figure 3, the centre of gravity of riders 30 and 31 is close to the centre of gravity of the tracks. By having the riders prone and the centre of the riders close to that of the track, there is less pitch and roll during the ride, lower centrifugal forces on the riders, and less onerous dynamic loads on the track. This allows for a lighter weight and less costly track and support structure construction. The track can also be constructed in natural or remote locations, for example on or adjourning ski fields. The track section shown in Figure 3 is straight but it should be noted that the track may twist or turn or even barrel roll. If the track does a half barrel roll, rider 30 will be positioned below the track while rider 31 will be above the track.

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It should be noted that the carriers 32 and 33 used in this embodiment are substantially identical so that each carrier may safely carry a rider whether the carrier is below or above the track.

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Figure 4 is a view taken through line AA on Figure 3 and without riders 30 and 31 in place. As can be seen in Figure 4, main track 38 includes two running rails 34 and 35 to which carriers 32 and 33 are slidingly engaged via wheel assemblies 36 and 37. As shown in Figure 3, each carrier has two wheel assemblies designated by numerals 36 and 37. In this embodiment, each wheel assembly includes two sets of wheels around the running rail and either a guide or a third set of wheels. Upper carrier 32 includes upper wheels 51 and lower wheels 50. The carrier also includes section 58 through which axle 55 runs. Axle 55 connects the carrier upper wheel 51 and cross pieces 57 together. Cross pieces 57 then extend down to axles 54 which are connected to lower wheel 50. Joint 56 along cross piece 57 may be a guide to keep the carrier in place along the running rail or may be a further wheel. The wheel assembly is repeated for lower carriage 33 which has lower axle 55 connecting lower wheels 53 and carrier 58 as well cross piece 57 and upper axle 54 connecting cross piece 57 with upper wheel 52.

Again centre portions 56 of the cross pieces 57 may be wheels for guides to keep the carriage in place on the running rails.

In preferred embodiments, the harness is designed to be light weight and the carriers are designed to be light weight in order that they may be carried by a single running rail and manhandled without mechanical assistance as previously described. Although in this Figure only two wheel assemblies are shown for each rider, more wheel assemblies may be used. It should also be noted in the embodiment of Figure 4 that the wheel assemblies 36 and 37 do not extend further outwards than the carriages 32 and 33 and so to help to assist in providing a feeling a danger and acceleration to the riders.

Figure 5 shows one embodiment of harness that may be used to harness a rider into a carrier. Rider 7 lies on the carrier and is harnessed to the carrier 32 by central harness 60 and arm and leg straps 61 - 64. Optional body straps 65, 66 may be used in addition to central harness 60.

In preferred embodiments carrier 32 is provided with hand grips 67, 68 that a rider can grip during the ride. The hand grips can be formed from any suitable material.

As shown in Figure 5 arm straps 61 and 62 are provided at the wrists of rider 7. In one embodiment the position of these straps is adjustable so that riders of different height can be harnessed in the carrier. As well as arm straps 61 and 62 at the wrists of rider 7 further arm straps may be provided to provide more support for the arms or to prevent the rider from making contact with the running rails or the track or any part of the support structure or support cables as the case may be, for example additional arm straps could be provided at the elbows.

As shown in Figure 5 leg straps 63 and 64 are provided at the ankles of rider 7. In one embodiment the position of these straps is adjustable so that riders of different height can be harnessed in the carrier. As well as leg straps 63 and 64 at the ankles of rider 7 further leg straps may be provided to provide more support for the legs, for example additional arm straps could be provided at the knees.

In the harness of Figure 5 control harness 60 extends from fin 69 between the legs of rider 7 to attachment points 70 and 71 at the shoulders of the rider. This arrangement provides full torso support for rider 7. As well as attachment points 70 and 71 at the shoulders of rider 7, further attachment point (not shown) may be provided along the torso of the rider. These additional attachment points are preferably adjustable width-wise to provide for riders of different sizes. In an alternative embodiment straps 65 and 66 are provided instead of or in addition to the additional attachment point of harness 60. In the embodiment of Figure 5 harness 60 is pivotally attached to fin 69.

10 The harness for the carrier securely harnesses the rider to the carrier. In one embodiment the same harness can be used for carriers on all running rails of the ride. This means that each harness must be suitable for harnessing a rider who may be upside down (with all their weight on the harness) for part of the ride. In another embodiment different harnesses are provided for different running rails of the ride. Carriers of
15 different lengths and different harnesses may also be provided for riders of different shape, for example a shorter harness and carrier may be provided for child riders. It is preferably that the harness is adjustable to account for riders with different sizes.

It should be noted that Figure 5 shows only one embodiment of harness and any suitable
20 harness may be used.

Figure 6 is a view of two riders on one embodiment of amusement ride of the invention. Upper rider 7 is in an upper carrier and lower rider 8 is in the lower carrier. In this embodiment both carriers are slidably engaged with running rails 11 and 12 by means
25 of sets of wheels that are arranged around running rails 11 and 12. The running rails in this embodiment are different to those shown in Figures 3 and 4. The carriers may also include braking means (not shown) and in the case of a complete loop track (such as that shown in Figure 2) means to engage with the lift mechanism to return the carriers to the top of the track. As can be seen from this Figure the slope and curve of the track is
30 not uniform. If the track is symmetrical the upper and lower carriers may be identical and interchangeable (in a non-continuous track ride). Alternatively the running rails on

each side of the track may be different and the upper and lower carriers may be different.

5 In Figure 6 rider 7 is shown lying flat on his/her stomach and facing forwards. The carrier could also be arranged so that the rider lies on his/her back and faces forward like a luge ride or any other suitable position.

10 Rider 8 is shown lying flat on his/her stomach and facing forward. This is a preferred position for riders under the track although other positions may be used. One alternative position is to suspend the rider below the track to allow more freedom of movement to the rider.

15 In this Figure the track is depicted so that the top half of the track is in effect a reflection of the bottom half of the track and the carriers shown may be utilised by either rider. Other forms of track are possible under the invention and different forms of carrier may be used for riders carried on different running rails of the track.

20 The foregoing descriptions indicate only two riders slidably engaged to the track and capable of moving through the same linear point of the track at the same time. These are indicated as riders engaged to the top and the bottom of the track. It is possible under the invention to extend the number of riders so engaged to three or more by adapting the cross section shape of the track to provide for more running rails to allow a third or more riders to become engaged to the track.

25 Figures 7A and 7B shows a portion of one embodiment of track 72 with three running rails 73 – 75. Track 72 has a circular cross-section as do running rails 73 – 75. The running rails may be attached to track 72 using any suitable means. The track 72 is attached to a support structure by attachment points 76.

30 Figures 7A and 7B show the track 72 and running rails 73 – 75 at one position along a ride. In this position (which may be at the start of the ride) running rail 74 is at the bottom of the track and running rails 73 and 75 are spaced around track 72 so that all the

running rails are equidistant. At this point the attachment means for attaching the track to a support structure are through the top of the rail. Along the ride track 72 may twist and the positions of the running rails may change. As this occurs the positions of the attachment points 76 may also change.

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Figure 7B is a cross-sectional view of the track 72 and running rails 73 – 75. Figure 7B also shows one set of wheels and part of a carrier 32 engaged with running rail 73. The set of wheels of carrier 32 are spaced around running rail 73 so that the carrier cannot disengage with the running rail except at the start and end of a non-continuous rail. The wheel axles may be attached to a semicylindrical tube that is then connected to the carrier. One advantage of attaching the wheel axles to a semicylindrical tube is that it protects the wheels from outside interference. In an alternative embodiment the wheel axles are connected directly to the base of the carrier.

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The track and running rails are not shown to scale in Figures 7A and 7B. The track must be large enough so that carriers on different running rail don't come into contact and remain a safe distance apart. The running rails must be dimensioned so that the carriers slidingly engage with the running rails and cannot disengage with the running rails except at the ends of a discontinuous track.

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Figures 8A and 8B shows a portion of another embodiment of track 77 with four running rails 78 – 81. Track 77 has a cross-shaped cross-section and running rails 78 – 81 have a circular cross-section. The running rails may be attached to track 77 using any suitable means. The track 77 is attached to a support structure by attachment points 72 and 83.

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Figures 8A and 8B show the track 77 and running rails 78 – 81 at one position along a ride. In this position (which may be at the start of the ride) the running rails are spaced equally between horizontal and vertical axes running through the centre of the running rail. At this point the attachment means for attaching the track to a support structure are at the side of the track. Along the ride, track 77 may twist and the positions of the

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running rails may change. As this occurs the positions of the attachment points 82 and 83 may also change.

Figure 8B is a cross-sectional view of the track 77 and running rails 78 – 81. Wheels on a carrier engaged with a running rail of track 77 may be similar to those described with reference to Figure 7B. In an alternative embodiment running rails 78 – 81 may be the flat ends of I-beam as shown in Figures 3 and 4 and the wheel assemblies of the carriers may be similar to those shown in Figure 4.

The track and running rails are not shown to scale in Figures 8A and 8B. The track must be large enough so that carriers on different running rail don't come into contact and remain a safe distance apart. The running rails must be dimensioned so that the carriers slidingly engage with the running rails and cannot disengage with the running rails except at the ends of a discontinuous track.

Figure 9 shows an example of a section of a track formed so that riders on the running rails perform a barrel roll as the track turns around a corner. Track 84 has upper running rail 85 and lower running rail 86. In the embodiment shown in Figure 9 the track and running rails form an I-beam like those shown in Figures 3 and 4. It should be noted that the track and running rails are not limited to this configuration. Track 84 is supported by two types of support members, rigid support members 87 and cable support member 88. The rigid support members may be connected together to form a support structure (not shown) and the support structure may include cable support member 88.

Cable support member 88 is attached to the middle of the track 84 when the running rails are in a vertical position. Cable support member 88 includes a rigid support 88 onto which cable 90 is attached. Cable 90 is attached to track 84 at its second end. Spacer 89 may be used as a guide for cable 90 to ensure that there is a sufficient gap between the cable and the running rails so that carriers on the running rails do not come into contact with the cable.

Use of cable 90 as part of the support structure for the ride provides a section of track that is able to move laterally as riders pass that point on the track providing a greater feeling of danger for the riders. Cable support members may be placed at any suitable point along the track. In some embodiments the cable support members may extend
5 through the track and be supported on both sides of the track. Spacers may also be used in these embodiments.

Figure 10 shows an embodiment of ride of the invention positioned down the slope of a ski field. Track 91 has a plurality of running rails (not shown) and starts from high
10 point 98 on the slope and ends at low point 97. Track 91 is supported by supports from existing chair lifts 96 and separate support members 95. The separate support members 95 may be connected together in groups to form structures and/or may be connected to the supports from existing chair lifts 96. The existing chair lifts 96 can be any existing structure on the slope that is suitable for supporting a track and ride.

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As can be seen in Figure 10 track 91 includes a turn 92, corkscrew 93 and barrel roll 94 along the length of the ride. These elements provide excitement to the ride and the riders.

20 The foregoing describes the invention including preferred forms thereof. Alterations and modifications as will be obvious to those skilled in the art are intended to be incorporated within the scope hereof as defined in the accompanying claims.

CLAIMS:

1. An amusement ride including:
a non-continuous track supported over a curved path and extending between a
5 high end and a low end, the track including at least two independent running rails,
at least one carrier arranged to carry at least one rider on each running rail of the
track,
the carriers including attachment means arranged to slidably engage with the
running rails to enable the carriers to descend carrying the riders from the high end to
10 the low end.
2. An amusement ride as claimed in claim 1 wherein the ride includes a mechanical
or other braking system to control the speed of the rider(s) during the descent or at the
conclusion of the ride or both.
15
3. An amusement ride as claimed in claim 1 or claim 2 wherein the running rails
include areas of different slope.
4. An amusement ride as claimed in any one of claims 1 to 3 wherein the running
20 rails include twists.
5. An amusement ride as claimed in any one of claims 1 to 4 wherein the running
rails include barrel rolls.
- 25 6. An amusement ride as claimed in any one of claims 1 to 5 wherein the track is
positioned around the outside of a structure from which the track is supported.
7. An amusement ride as claimed in any one of claims 1 to 5 wherein the track is
positioned inside a valley or natural feature.
30
8. An amusement ride as claimed in any one of claims 1 to 5 wherein the track is
positioned down the side of a hill or sloping surface.

9. An amusement ride as claimed in any one of claims 1 to 8 wherein the track is supported partially or totally by cables.

5 10. An amusement ride as claimed in any one of claims 1 to 9 wherein the bottom of the track is close to a means of access to the top of the track.

11. An amusement ride as claimed in any one of claims 1 to 10 wherein each carrier is slidingly engaged to a running rail by at least one set of wheels.

10 12. An amusement ride as claimed in any one of claims 1 to 11 wherein the carrier is lightweight.

13. An amusement ride as claimed in any one of claims 1 to 12 wherein the running rails are an integral part of the track.

15 14. An amusement ride as claimed in any one of claims 1 to 13 wherein not all the running rails have the same shape.

20 15. An amusement ride as claimed in any one of claims 1 to 13 wherein all the running rails have the same shape.

25 16. An amusement ride as claimed in any one of claims 1 to 15 wherein there is provided a mechanical and/or electrical means to elevate the carriers to the high end of the track.

17. An amusement ride as claimed in any one of claims 6 to 16 wherein the riders start the ride from a platform at the top of the support structure.

30 18. An amusement ride as claimed in any one of claims 1 to 17 wherein the riders are carried in carriers in a substantially prone position.

19. An amusement ride including:

a track supported over a curved path, the track including a high point and a low point and including at least two independent running rails,

at least one carrier arranged to carry at least one rider on each running rail of the track in a substantially prone position,

the carriers including attachment means arranged to slidingly engage with the running rails to enable the carriers to traverse the ride carrying the riders.

20. An amusement ride as claimed in claim 19 wherein the ride includes a mechanical or other braking system to control the speed of the rider(s) during the descent or at the conclusion of the ride or both.

21. An amusement ride as claimed in claim 19 or claim 20 wherein the running rails include areas of different slope.

22. An amusement ride as claimed in any one of claims 19 to 21 wherein the running rails include twists.

23. An amusement ride as claimed in any one of claims 19 to 22 wherein the running rails include barrel rolls.

24. An amusement ride as claimed in any one of claims 19 to 23 wherein the track is positioned around the outside of a structure from which the track is supported.

25. An amusement ride as claimed in any one of claims 19 to 24 wherein the track is positioned inside a valley or natural feature.

26. An amusement ride as claimed in any one of claims 19 to 24 wherein the track is positioned down the side of a hill or sloping surface.

27. An amusement ride as claimed in any one of claims 19 to 26 wherein the track is supported partially or totally by cables.

28. An amusement ride as claimed in any one of claims 19 to 27 wherein each carrier is slidingly engaged to a running rail by at least one set of wheels.

29. An amusement ride as claimed in any one of claims 19 to 28 wherein the carrier
5 is lightweight.

30. An amusement ride as claimed in any one of claims 19 to 29 wherein the running rails are an integral part of the track.

10 31. An amusement ride as claimed in any one of claims 19 to 30 wherein the track includes more than two running rails.

32. An amusement ride as claimed in any one of claims 19 to 31 wherein not all the running rails have the same shape.

15 33. An amusement ride as claimed in any one of claims 19 to 31 wherein all the running rails have the same shape.

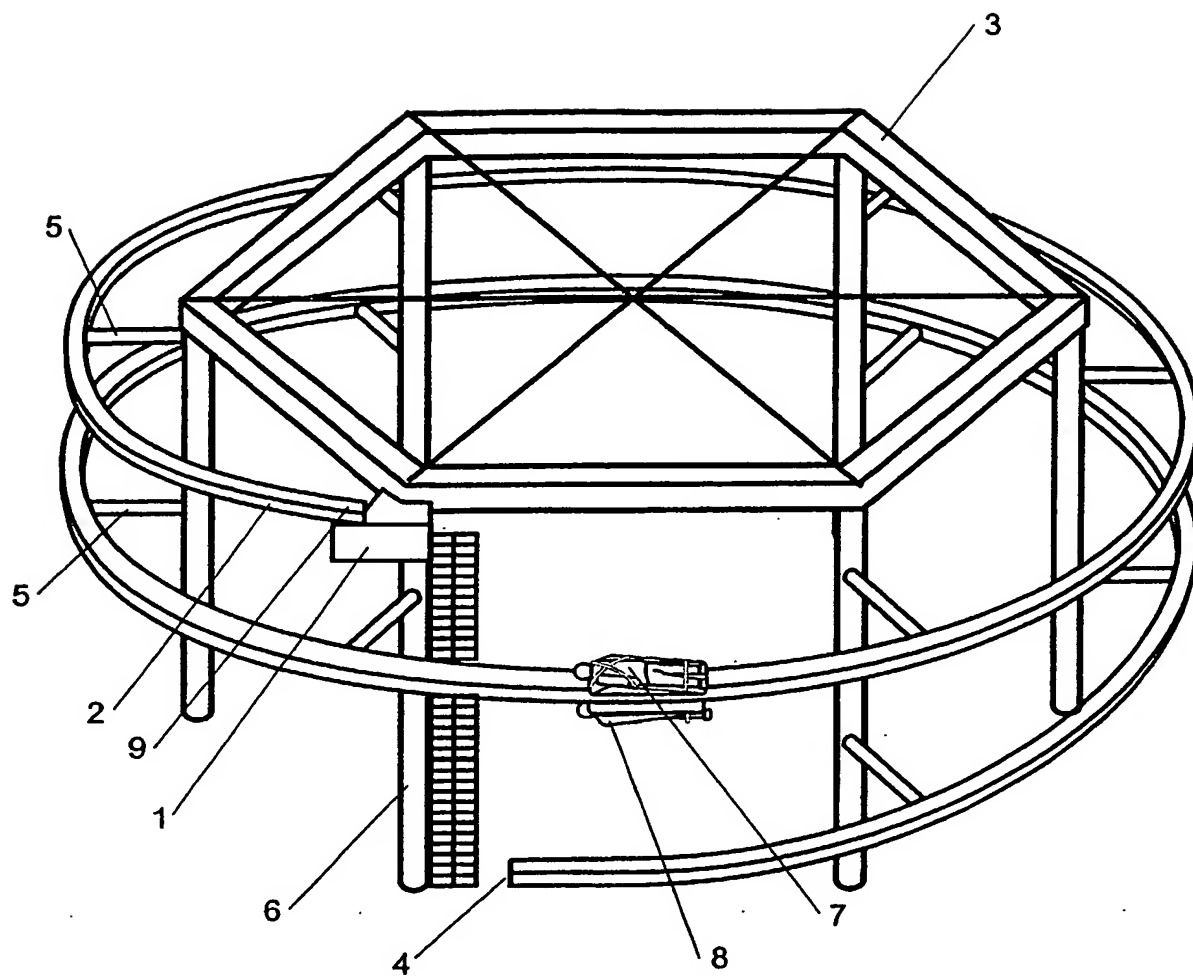
34. An amusement ride as claimed in any one of claims 19 to 33 wherein the track
20 includes mechanical means to elevate the riders from the low point of the track to the high point of the track from where the riders descend to the low end of the track under gravity.

35. An amusement ride as claimed in any one of claims 1 to 18 wherein the rides
25 descend the track from the high end of the track to the low end of the track under gravity.

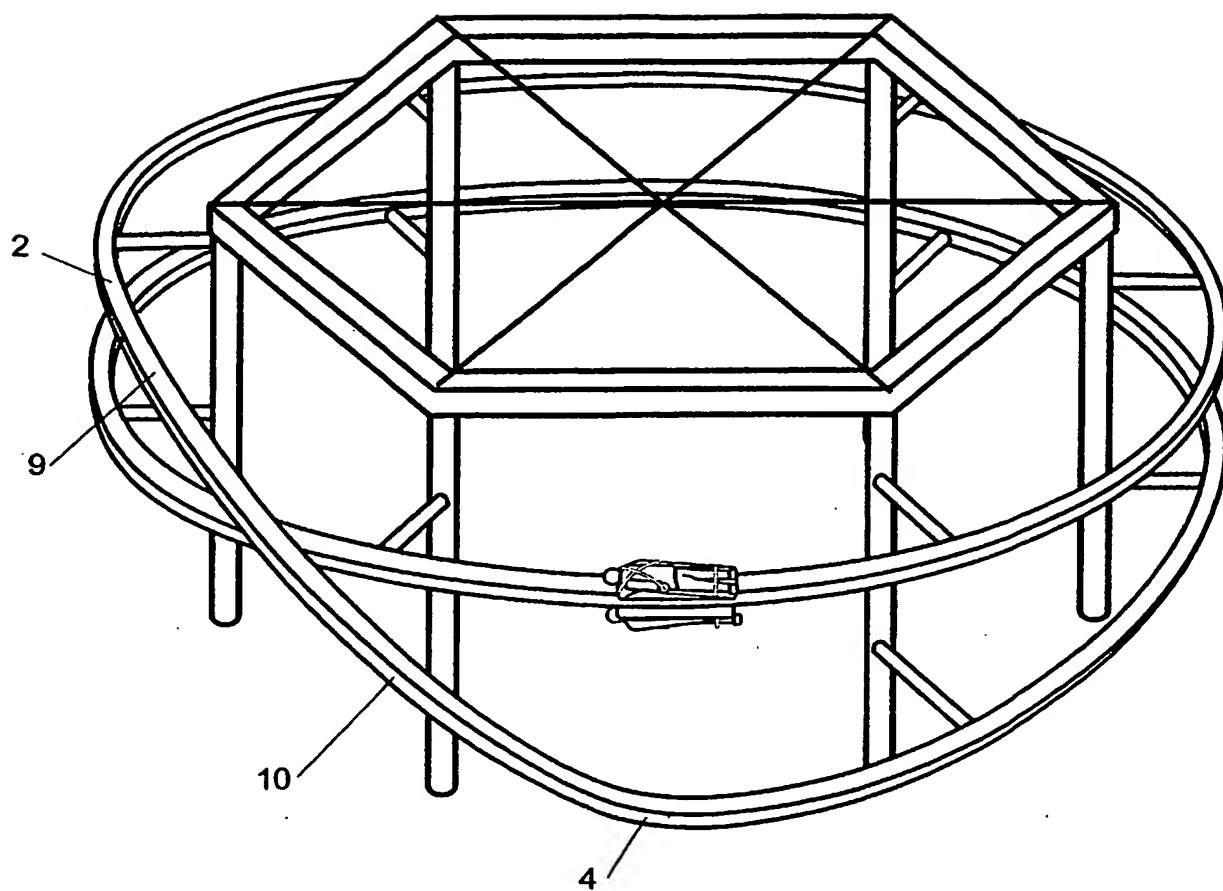
36. An amusement ride as claimed in any one of claims 1 to 18 wherein the carriers are propelled along the track by electrical and/or mechanical means.

30 37. An amusement ride as claimed in any one of claims 19 to 33 wherein the carriers are propelled along the track by electrical and or mechanical means.

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**FIGURE 1**

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**FIGURE 2**

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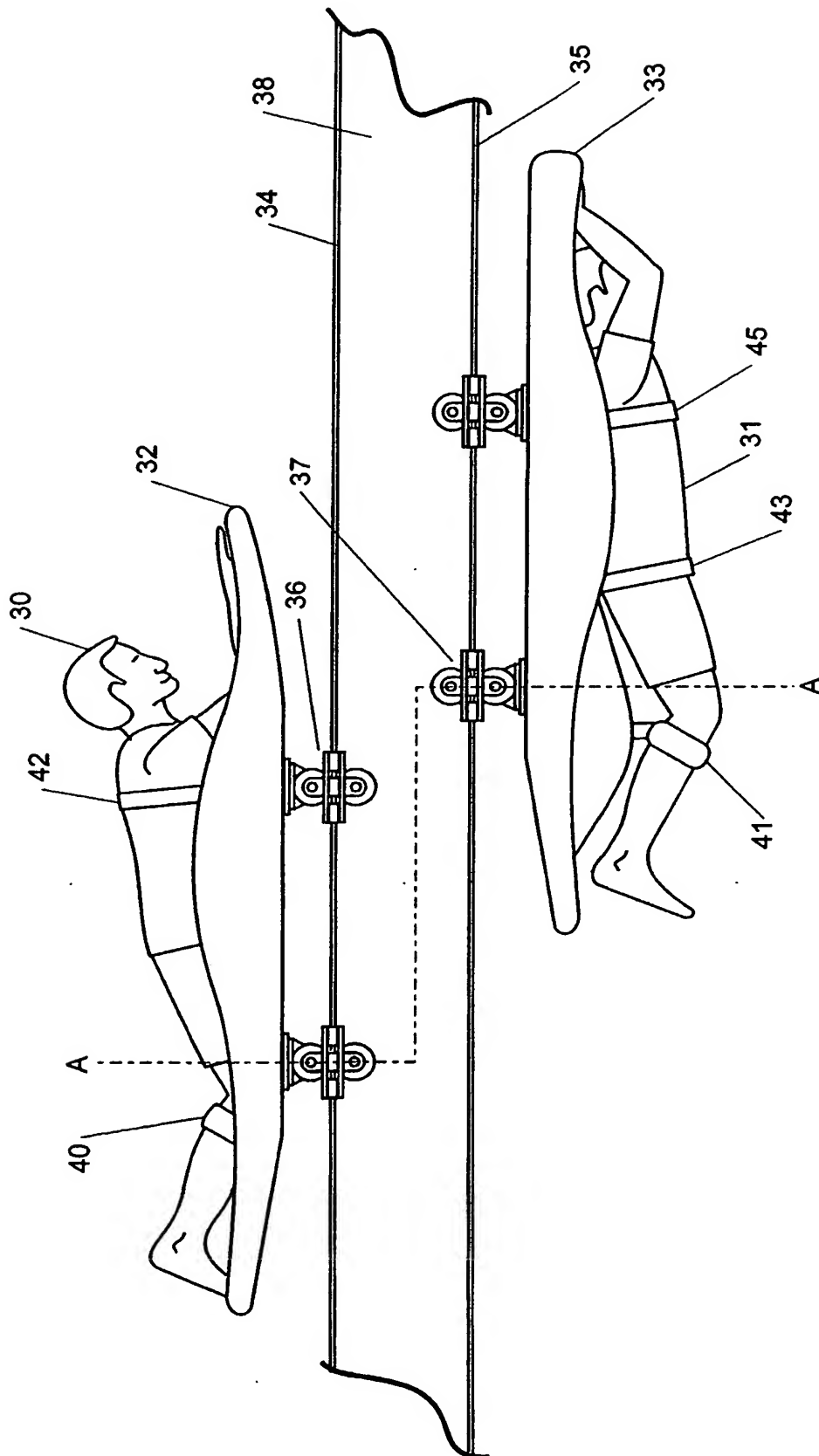


FIGURE 3



FIGURE 4

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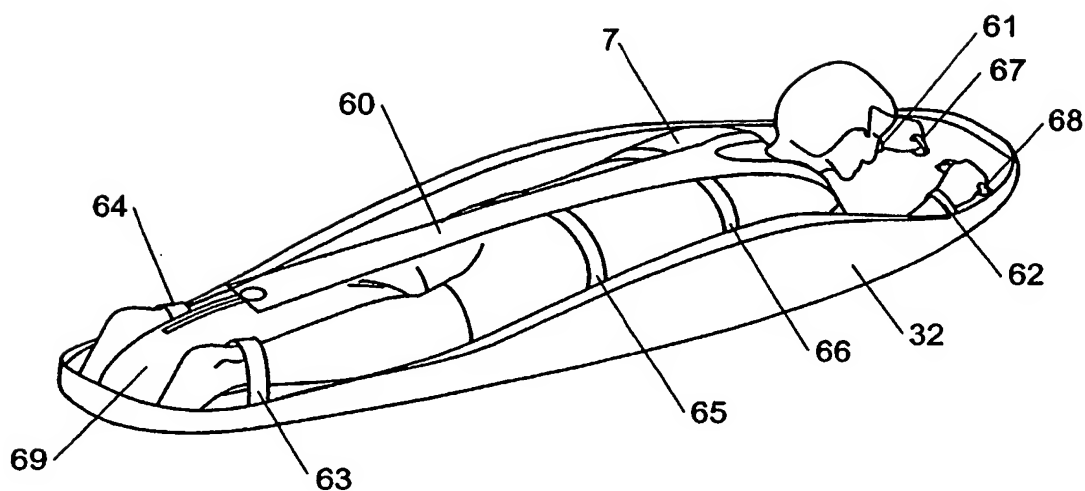


FIGURE 5

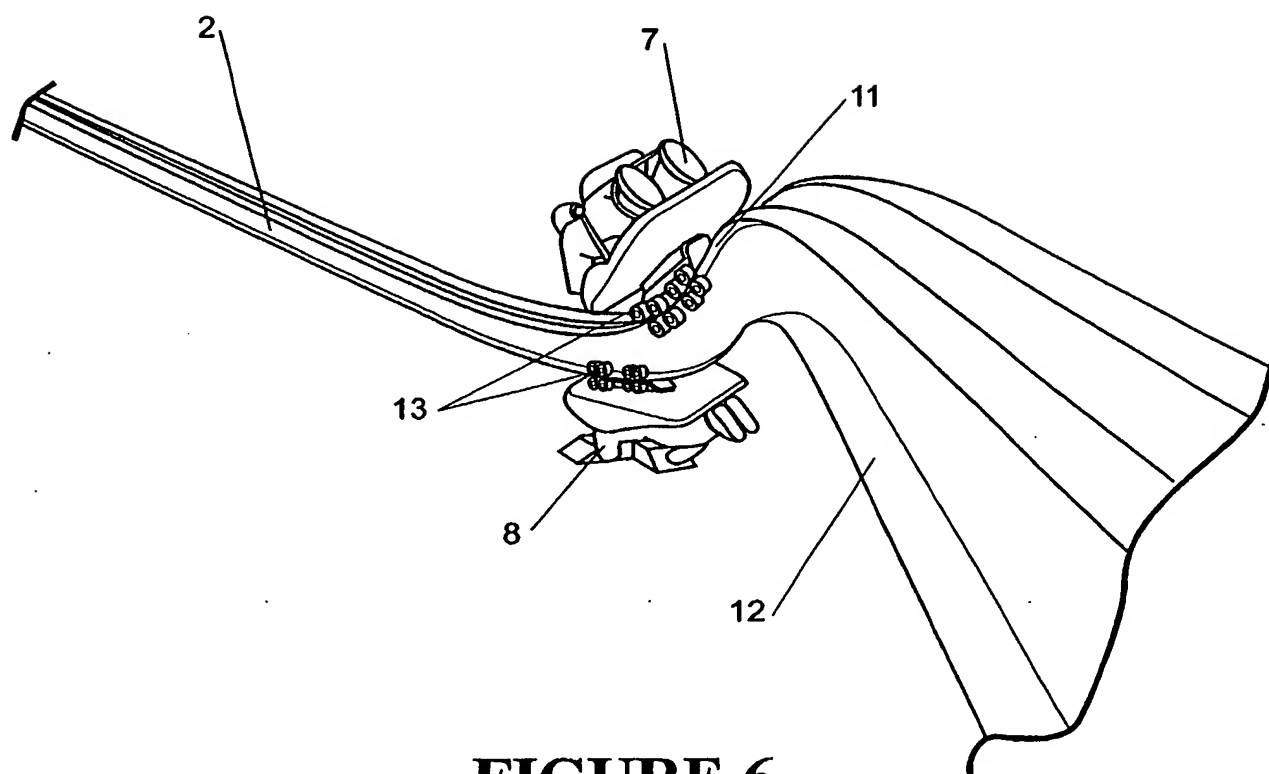


FIGURE 6

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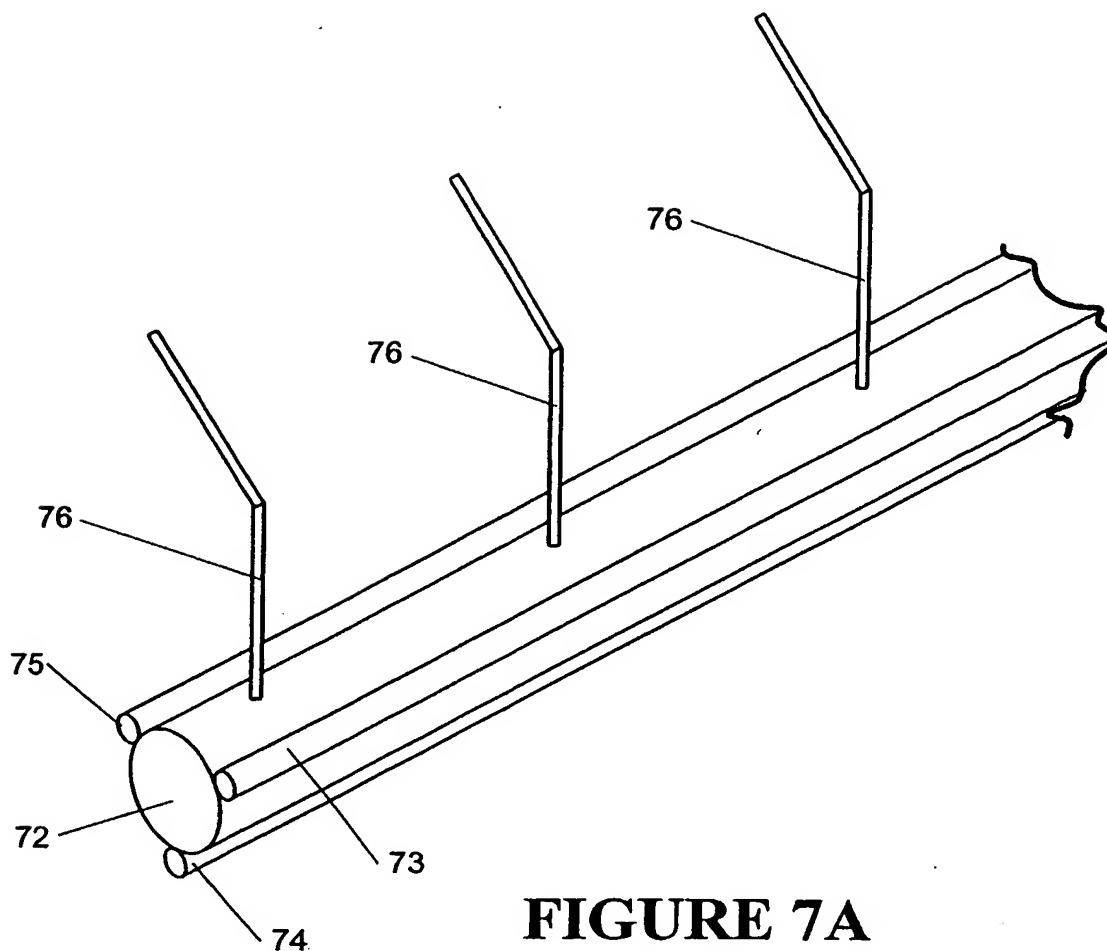
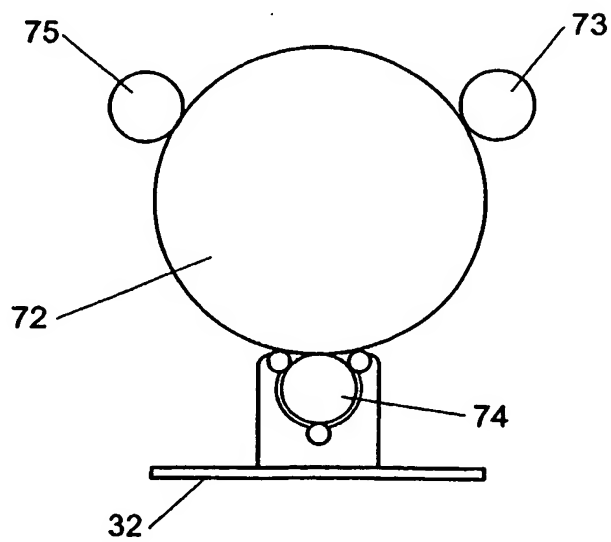


FIGURE 7A

FIGURE 7B



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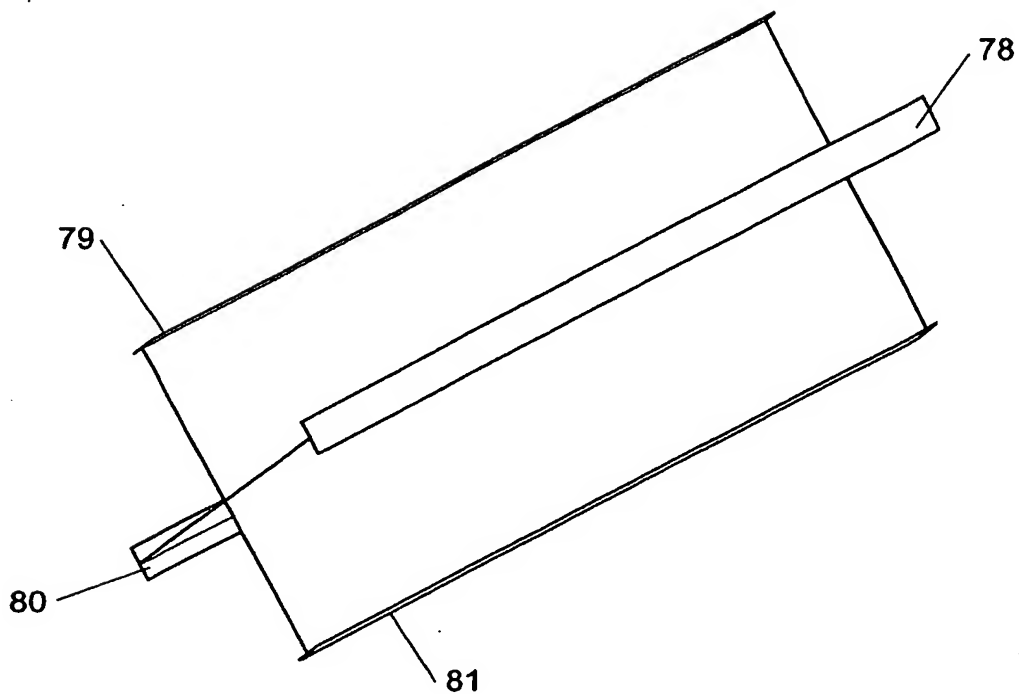


FIGURE 8A

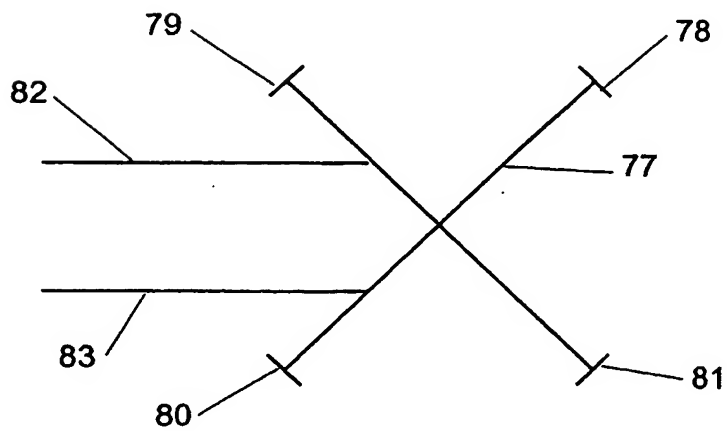


FIGURE 8B

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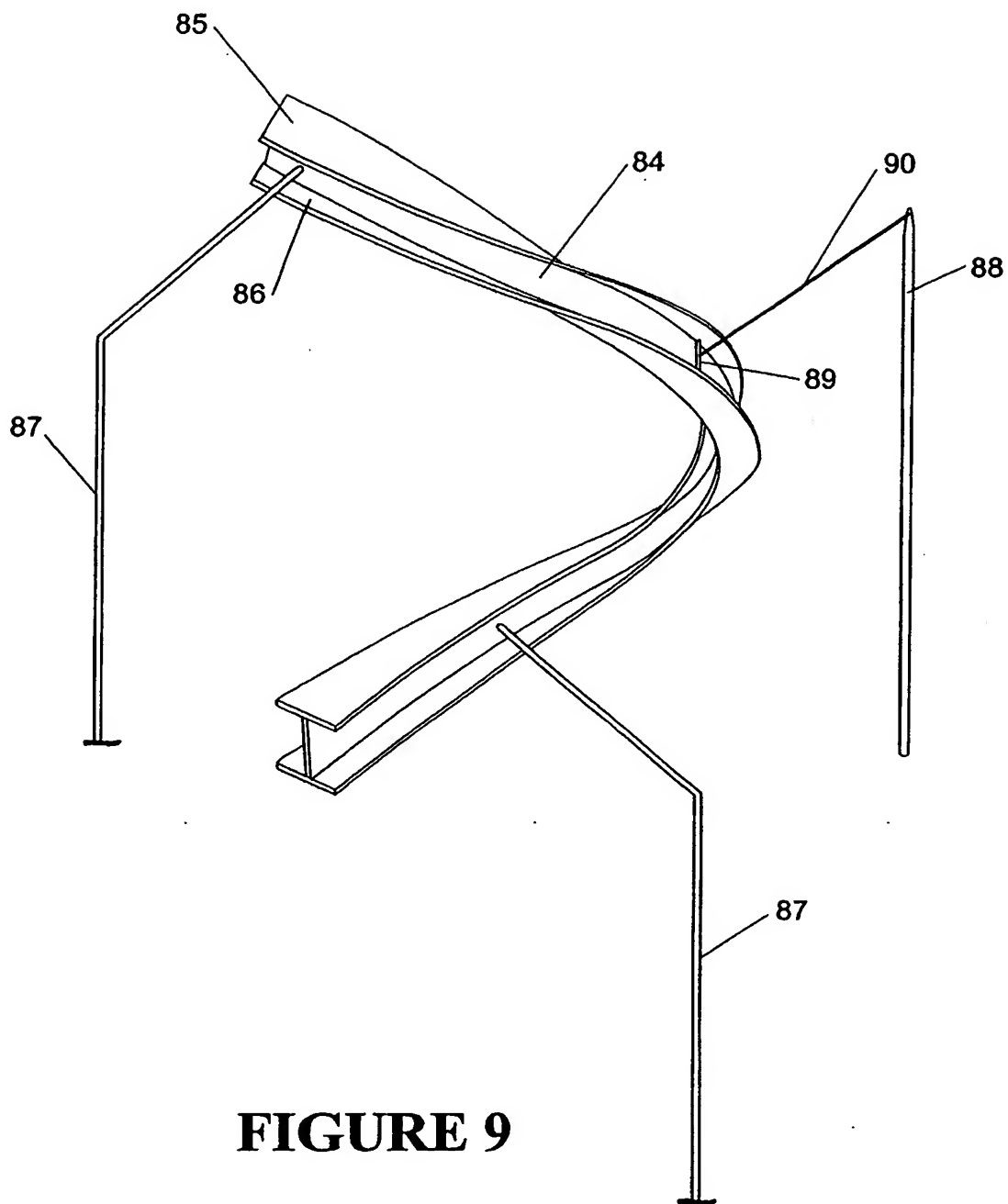
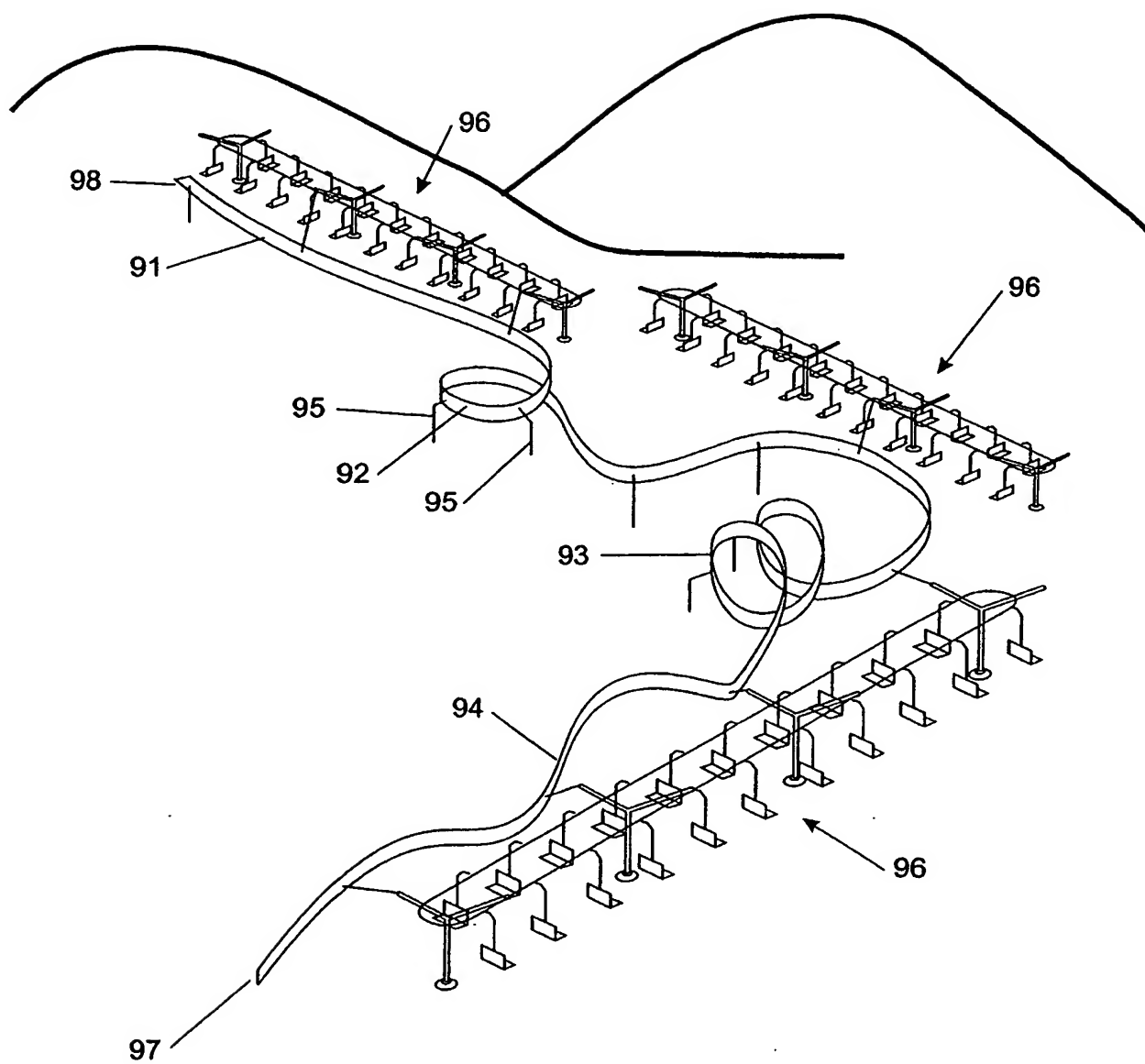


FIGURE 9

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**FIGURE 10**

INTERNATIONAL SEARCH REPORT

International application No.

PCT/NZ03/00192

A. CLASSIFICATION OF SUBJECT MATTERInt. Cl. ⁷: A63G 31/08, 7/00, 33/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
 DWPI:IPC A63G 1/-, 25/-, 21/-, 7/-, 31/-, 33/- & keywords: (roller coaster, amusement ride, track, rail, non-continuous, carrier, dual) and similar terms.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 96/22821 A (D C F HICKMAN LIMITED) 1 August 1996 Whole document	1-37
A	US 6402624 B1 (LARSON ET AL) 11 June 2002 Whole document	1-37
P,A	WO 02/085478 A (SHEPHERD ET AL) 31 October 2002 Whole document	1-37

☐ Further documents are listed in the continuation of Box C☒ See patent family annex

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"E" earlier application or patent but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search
23 October 2003

Date of mailing of the international search report
29 OCT 2003

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/NZ03/00192

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member	
WO	96/22821	AU	44543/96
US	6402624	AU	16260/00
US		US	2002042303
WO	00/29086		
WO	02/085478	NONE	
END OF ANNEX			